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10/705,433	11/12/2003	Kanya Ishizaka	117730	4586

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EXAMINER	
TORRES, JOSE	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/705,433	ISHIZAKA, KANYA	
	Examiner	Art Unit	
	JOSE M. TORRES	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 April 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-33 and 35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,8-11,16-19,24-27,32,33 and 35* is/are rejected.

7)☒ Claim(s) *4-7,12-15,20-23 and 28-31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/18/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Comments

1. The Request for Consideration filed on April 10, 2008 has been entered and made of record.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 1, 8, 9, 18, 24, 25 and 35 rejected under 35 U.S.C. 102(a) as being anticipated by Masatoshi (JP 2002-185770).

Re claims 1, 18 and 35, Masatoshi disclose image processing apparatus/method (FIG. 1, "Image Processing Device **1**")/computer-readable storage medium storing a program for causing a computer to execute an image processing ("Recording Medium", Paragraph [0027]) for performing an image quality improving processing of an image, comprising: a domain block extracting section (FIG. 1, "Local Domain Image Acquiring Part **3**") for extracting a domain block image from an original image in the unit of a first block unit ("nxm", Paragraphs [0008] and [0031]); a range block extracting section (FIG. 1, "Affine Resolution Picture Acquisition Part **6**") for extracting a range block image from the original

image in the unit of a second block unit which is larger than the first block unit with respect to the domain block image ("quadrupled size of an image block", Paragraphs [0010], [0032] and [0034]); a reduced range block forming section (FIG. 1, "Reducing Part **8**") for reducing the extracted range block image to the size of the first block unit (Paragraphs [0012] and [0034]); and an improved domain block forming section (FIG. 1, "Substitution Part **10**") for performing a pixel value conversion ("affine transformation") with respect to the reduced range block image formed by the reduced range block forming section, and for outputting the pixel-value-converted reduced range block image as an improved domain block image (Paragraphs [0013], [0014], [0023] and [0034]); and a similarity degree judging section (FIG. 1, "Similarity Calculation Part **9**") for judging a similarity degree between the domain block image and the reduced range block image by the reduced range block forming section, the improved domain block forming section performs the pixel value conversion based upon the similarity degree obtained by the similarity degree judging section (Paragraphs [0014]-[0024], [0035] and [0036]).

Re claims 8 and 24: Masatoshi disclose the range block extracting section extracts the range block image which contains the domain block image extracted by the domain block extracting section as the range block image (Paragraph [0032]).

Re claims 9 and 25: Masatoshi disclose the range block extracting section extracts a plurality of the range block images with respect to one of the domain block images (Paragraphs [0010], [0032] and [0034]); the reduced range block forming section executes a reducing processing as to the plurality of range block images (Paragraphs [0013], [0014], [0023] and [0034]); and the similarity degree judging section selects a reduced range block image which is judged as the image having the highest similarity degree with respect to the domain block image among a plurality of the reduced range block images (Paragraphs [0014]-[0024], [0035] and [0036]).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 3, 8-1, 18, 19, 24-27 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon et al. (U.S. Pat. No. 5,701,369) in view of Jacobs et al. (U.S. Pat. No. 5,416,856).

As to claims 1 and 18, Moon et al. teaches an image processing apparatus/method for performing an image quality improving processing of an image, comprising: a domain block extracting section (FIG. 3, "Control Unit **20** and Range Block Memory **40**") for extracting a domain block image (FIG. 1, "Range Block Ri") from

an original image (FIG. 1, "Composite Image **100**") in the unit of a first block unit (Col. 3 lines 34-56); a range block extracting section (FIG. 3, "Control Unit **20** and Domain Block Memory **30**") for extracting a range block image (FIG. 1, "Domain Block Dj") from the original image in the unit of a second block unit which is larger than the first block unit with respect to the domain block image (Col. 3 lines 34-56); a reduced range block forming section (FIG. 3, "Control Unit **20**") for reducing the extracted range block image to the size of the first block unit (Col. 5 line 54 through Col. 6 line 29 and Col. 7 lines 31-36); and a similarity judging section (FIG. 3, "Control Unit **20**") for judging a similarity degree ("Maximum Degree of Similarity") between the domain block image and the reduced range block image by the reduced range block forming section (Col. 6 lines 55-61).

However, Moon et al. does not explicitly disclose an improved domain block forming section for performing a pixel value conversion with respect to the reduced range block image formed by the reduced range block forming section, and for outputting the pixel-value-converted reduced range block image as an improved domain block; the improved domain block forming section performs the pixel value conversion based upon the similarity degree obtained by the similarity degree judging section.

Jacobs et al. teaches an improved domain block forming section (FIG. 7, "Optimizer and Transformer **30**") for performing a pixel value conversion ("transformation") with respect to the reduced range block image formed by the reduced range block forming section (FIG. 7, "Partitioner **26** and Partitioner **28**"), and for outputting the pixel-value-converted reduced range block image as an improved domain

block (Col. 9 line 61 through Col. 10 line 16); the improved domain block forming section performs the pixel value conversion based upon the similarity degree ("best") obtained by the similarity degree judging section (FIG. 7, "Processor **32** and Comparator **34**" As stated in at least Col. 4 lines 13-51, line 59 through Col. 5 line 50, Col. 7 lines 19-48 and Col. 9 line 61 through Col. 10 line 16, the Processor **32** and Comparator **34** performs error calculation and the output of the domain which best minimizes the error, therefore, outputting a domain which is based on a "best" match scheme. The pixel value transformation (using the optimized transformation wj) for the domain corresponds to an improved domain block.).

Therefore, in view of Jacobs et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Moon et al. by incorporating the processor and the comparator to perform a pixel value conversion with respect to the reduced range block image based upon a similarity degree in order to compactly store an image at a desired level of fidelity (Col. 3 lines 33-55 and Col. 4 lines 1-13).

As to claims 3 and 19, Jacobs et al. teaches a domain block classifying section ("Classification Scheme") for classifying a sort of the domain block image extracted by the domain block extracting section, wherein the domain block image other than the domain block image which has been classified to a previously determined sort is directly outputted as the improved domain block image (Col. 7 lines 19-48).

As to claims 8 and 24, Moon et al. teaches the range block extracting section extracts the range block image which contains the domain block image, extracted by the domain block extracting section as the range block image (FIG. 4A, Col. 5 lines 28-41).

As to claims 9 and 25, Moon et al. teaches the range block extracting section extracts a plurality of the range block images with respect to one of the domain block images (FIG. 4, Col. 5 lines 28-36); the reduced range block forming section executes a reducing processing as to the plurality of range block images (Col. 5 lines 54-61); and the similarity degree judging section selects a reduced range block image which is judged as the image having the highest similarity degree with respect to the domain block image among a plurality of the reduced range block images (Col. 6 lines 40-61).

As to claims 10 and 26, Moon et al. teaches wherein when a pixel value "z" of the reduced range block image is least-squares-approximated ("least square method") to the pixel value of the domain block image by a linear transformation "az + b" (Equation (1)), the similarity degree judging section judges the reduced range block image having the smallest least squares error ("Optimal m and n") as a most resemblant reduced range block image having the highest similarity degree (FIG. 3, "Slope and Offset Detector **50**", Col. 5 line 61 through col. 6 line 39).

As to claims 11 and 27, Moon et al. teaches wherein the improved domain block forming section forms the improved domain block image in such a way that the pixel

value of the most resemblant reduced range block image is converted by the linear transformation "az + b" (Equation (1)) with employment of least squares coefficients "a" ("m") and "b" ("n"), which correspond to the most resemblant reduced range block image obtained by the similarity degree judging section (FIG. 3, "Slope and Offset Detector **50**", Col. 5 line 61 through col. 6 line 39).

As to claim 35, Moon et al. disclose extracting a domain block image (FIG. 1 "Range Block Ri") from an original image (FIG. 1, "Composite Image **100**") in a size of a first block unit (Col. 3 lines 34-56); extracting a range block image (FIG. 1, "Domain Block Dj") from the original image in the unit of a second block unit larger than the first block unit with respect to the domain block image (Col. 3 lines 34-56); reducing a size of the extracted range block image to the size of the first block unit (Col. 5 lines 54-61); and judging a similarity degree between the reduced range block image and the domain block image (Col. 6 lines 40-54).

However, Moon et al. does not explicitly disclose a computer-readable storage medium storing a program for causing a computer to execute an image processing, and forming an improved domain block image based upon a result obtained by converting pixel values as to the reduced range block image based upon the similarity degree.

Moon et al. teach an image compression device comprising storage means, calculating means and control means (Claim 12), which corresponds to a memory and a processor. Since these type of computer devices are controlled by computer-implemented instructions, it would be apparent to one of ordinary skill in the art to

implement the image processing device, as taught by Moon et al., as a computer program stored on a computer readable storage.

Jacobs et al. teaches forming an improved domain block image based upon a result obtained by converting pixel values as to the reduced range block image based upon the similarity degree (FIG. 7, "Processor **32** and Comparator **34**" As stated in at least Col. 4 lines 13-51, line 59 through Col. 5 line 50, Col. 7 lines 19-48 and Col. 9 line 61 through Col. 10 line 16, the Processor **32** and Comparator **34** performs error calculation and the output of the domain which best minimizes the error, therefore, outputting a domain which is based on a "best" match scheme. The pixel value transformation (using the optimized transformation w_j) for the domain corresponds to an improved domain block.).

Therefore, in view of Moon et al. and Jacobs et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the image processing system as a computer program stored on a computer readable storage in order to accomplish a real time image processing system by reducing the number of the domain blocks to be evaluated (Moon et al. Col. 7 lines 31-36), incorporating the processor's and the comparator's instructions to perform a pixel value conversion with respect to the reduced range block image based upon a similarity degree in order to compactly store an image at a desired level of fidelity (Jacobs et al. Col. 3 lines 33-55 and Col. 4 lines 1-13).

6. Claims 16, 17, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon et al. in view of Jacobs et al. as applied to claims 1 and 18 above, and further in view of Bonneau et al. (U.S. Pat. No. 6,002,794). The teachings of Moon et al. and Jacobs et al. have been discussed above.

As to claims 16 and 32, Moon et al. teaches the domain block extracting section extracts the domain block image in such a manner that the domain block image owns a cover portion on the original image (FIG. 1, Col. 3 lines 35-56).

However, Moon et al. and Jacobs et al. fails to teach an averaged value calculating section for calculating an average value with respect to pixels where a plurality of the improved domain block images are overlapped with each other.

Bonneau et al. teaches an averaged value calculating section for calculating an average value with respect to pixels where a plurality of the improved domain block images are overlapped with each other (FIG. 1, "Step **107**", Col. 8 lines 36-63, FIG. 4, "Domain Blocks **401**", Col. 13 lines 30-52 and FIG. 18, "Video Encoding Portion **1801**", Col. 25 lines 22-36).

Therefore, in view of Bonneau et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Moon et al. and Jacobs et al. by incorporating the video encoding portion to calculate an average value and where the improved domain blocks images are overlapped with each other in order to increase the compression ratio and allow faster processing (Col. 18 lines 33-35).

As to claims 17 and 33, Bonneau et al. teaches the original image corresponds to a color image (FIG. 19, Col. 26 lines 9-19), and the range block extracting section (FIG. 18, "Video Encoding Portion **1801**") extracts the range block images from relatively same positions as to the respective color components of the original image (FIG. 1, "step **105**" Col. 8 lines 1-3, Col. 25 lines 22-36 and Col. 26 lines 20-48).

Therefore, in view of Bonneau et al., it would have been obvious to one of ordinary skill in the art at. the time the invention was made to modify Moon et al. and Jacobs et al. by incorporating the original image as a color image and the video encoding portion to extract the range block images from relatively same positions as the respective color components of the color image in order to achieve high compression, have selective and accurate feature preservation and is computationally efficient (Col.. 5 lines64-67).

Allowable Subject Matter

7. Claims 4-7, 12-15, 20-23 and 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

For a statement of reasons for the indication of allowable subject matter see the Non-Final Action mailed on January 16, 2008, Page 10, Section 5.

Response to Arguments

Claim Rejections under 35 U.S.C. §103

8. With respect to claims 1, 18 and 35, Applicant's arguments been fully considered but they are not persuasive. Applicant alleges that Jacobs et al. does not teach or suggest the features of an improved domain block forming section for performing a pixel value conversion with respect to the reduced range block image formed by the reduced range block forming section, for outputting the pixel-value-converted reduced range block image as an improved domain block image, and the improved block forming section performs the pixel value conversion based upon the similarity degree obtained by the similarity degree judging section. Specifically Applicant alleges that the selection of a domain and corresponding transformation which best minimizes an error cannot reasonably be considered to teach, or to have suggested, performing a pixel value conversion with respect to the reduced range block image formed by the reduced range block image forming section and outputting the pixel-value converted reduced range block image as an improved domain block and the improved domain block forming section performing pixel value conversion based upon the similarity degree obtained by the similarity degree judging section. Applicant alleges that Jacobs simply does not use such a comparison to perform the disclosed function (See Request for Reconsideration filed on April 10, 2008, Page 2 lines 5-13 and Page 3 lines 7-13). Examiner respectfully disagrees.

Jacobs et al. teaches that for a range R_i, a domain D_j an corresponding local transformation w_j are sought that will minimize the error between the image over R_i and

the transformation of the image over D_i (Col. 4 lines 24-27). Therefore, the Comparator **34** (FIG. 7) is performing a comparison between two images (the domain image D_i and the domain image after a transformation w_i is applied, see Col. 5 lines 19-51 and Col. 9 line 51 through Col. 10 line 16). A similarity degree (which is the minimized error) is judged for a domain block image and a reduced range block image, so that an optimum transformation can be subsequently founded. This achieves information defining the ranges, domains and transformation that needs to be stored or transmitted, and the transformations obtained results in a minimum error when applied to the image over D_i.

Therefore, the rejections are maintained.

With respect to claims 3, 8-11, 16, 17, 19, 24-27, 32 and 32, Applicant's arguments are no different from those previously presented with respect to claims 1, 18 and 35, and already addressed above.

Therefore, the rejections are maintained.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Matsuhira disclose an Image Processing Device and Image Processing Method (Claims priority to JP Publication No. 2002-185770).

Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on March 18, 2008 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS**

MADE FINAL. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSE M. TORRES whose telephone number is (571)270-1356. The examiner can normally be reached on M-F: 8:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jingge Wu/
Supervisory Patent Examiner, Art Unit 2624

/JOSE M. TORRES/
07/30/2008
Examiner, Art Unit 2624